REMARKS

Claims 1-29 are pending, of which claims 23-29 are withdrawn from consideration. Claims 1-22 are rejected. Claim 20 is objected to. By this response, Applicants amend claim 1 to include the limitations of claims 7 and 16. Applicants cancel claims 2-16, 21 and 22 without prejudice. Applicants also amend claim 17 to depend from claim 1. Applicants further amend claim 20 to correct a minor typographical error. As such, no new matter has been added. Applicants respectfully request reconsideration of this application.

Claim Objections

Claim 20 is considered objectionable for informalities. Applicants amend claim 20 to remove "a')" from the claim as requested.

Claim Rejections - 35 U.S.C. §§ 102 and 103

Claims 1-9 and 19-22 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Kijima* et al. (US Pat No 5,897,956). Applicants respectfully traverse this rejection.

The present application provides a near-infrared absorbent glass composition that is capable of reducing thermal feeling, particularly for glasses having a small thickness. Thermal feeling is the rise in skin temperature that people feel on their skin caused by sunlight that transmits through a glass. Thermal feeling can be characterized using the optical property of the glass such as "transmittance for thermal feeling" as defined by Equation 1 of the present application. Independent claim 1 is directed to a near-infrared absorbent glass composition that includes a combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35. Compared to conventional infrared absorbent glasses, the claimed glass composition has relatively high contents of T-Fe_2O_3 and CeO_2. Such a combination of T-Fe_2O_3 content, CeO_2 content and FeO ratio, particularly the relatively high contents of T-Fe_2O_3 and CeO_2, gives rise to a substantially reduced thermal feeling for glasses having a small thickness that can be as low as 40% or less.

Kijima relates to a glass composition that includes a T-Fe_2O_3 content of 0.53-0.70 wt%, a CeO_2 content of 0.5-0.8 wt% and a FeO ratio of 0.30-0.40 (see, e.g., *Kijima* at Abstract). Thus, *Kijima* fails to disclose the claimed combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35. Also, *Kijima* repeatedly teaches against the use of a T-Fe_2O_3 content that is higher than the range disclosed by *Kijima*. For example, at column 2, lines 27-31, *Kijima* states: "... if [the content of the total iron calculated as Fe_2O_3] is too large, the specific gravity of the glass will be too high, whereby the above-mentioned change of the composition of glass will require a long period of time, and the productivity will be low." At column 2, lines 50-53, *Kijima* also states: "... if [the Fe_2O_3 content] is too large, it takes a long time for the change of the composition, and the productivity will be low. Specifically, Fe_2O_3 is preferably contained in an amount of from 0.35 to 0.49 wt % in the glass." At column 4, lines 3-7, *Kijima* further states: "In the glass of the present invention having low solar radiation and ultraviolet ray transmittance, the total iron calculated as Fe_2O_3 and the contents of Fe_2O_3 and FeO are particularly preferably within the ranges as disclosed in Table 1 ..." (Note: the T-Fe_2O_3 content disclosed in *Kijima*'s Table 1 is 0.70 wt% or less). At column 4, line 67 to column 5, line 3, *Kijima* also states: "... if [the content of the total iron calculated as Fe_2O_3] is large, the visible light transmittance tends to be too small. The content of the total iron is preferably at most 0.64 wt %, more preferably at most 0.63 wt %." As such, one skilled in the art would have no reason to modify *Kijima*'s glass composition to increase its T-Fe_2O_3 content to a higher level of 0.98 to 1.3 mass% as recited in independent claim 1. Thus, independent claim 1 is patentable over *Kijima*. So are claims 17-20 since these claims depend from claim 1. Applicants cancel claims 2-16, 21 and 22 without prejudice and thus the § 102 rejection of claims 2-9, 21 and 22 over *Kijima* is now moot.

Claim 17 is further patentable over *Kijima* for the following additional reason. Claim 17 depends from claim 1 and further recites the glass has a thickness of 1.3 to 1.8 mm. *Kijima* does not disclose a glass that both has a thickness range of 1.3 to 1.8 mm, as recited in claim 17, and a combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35, as recited in claim 1.

Claims 1-8, 10, 12, 18 and 19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Nagashima* et al. (US Pat No 6,046,122). Applicants respectfully traverse this rejection. *Nagashima* relates to a glass composition that includes a T-Fe_2O_3 content of 0.40-0.90 wt%, a CeO_2 content of 1.0-2.0 wt% and a FeO ratio of 0.27-0.40 (see, e.g., *Nagashima* at Abstract). Thus, *Nagashima* fails to disclose the combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35, as claimed in independent claim 1. Also, *Nagashima* repeatedly teaches against the use of a T-Fe_2O_3 content that exceeds the range disclosed by *Nagashima*. For example, at column 3, lines 14-21, *Nagashima* states: "The ultraviolet and infrared radiation absorbing glass of the present invention preferably comprises, when the glass has a thickness of 4.75 to 6.25 mm, 0.40 to 0.60% by weight of total iron oxide (T-Fe_2O_3) in terms of Fe_2O_3. The ultraviolet and infrared radiation absorbing glass of the present invention preferably comprises, when the glass has a thickness of 3.25 to 4.25 mm, 0.60 to 0.90% by weight of total iron oxide (T-Fe_2O_3) in terms of Fe_2O_3." (See, also, Id. at column 4, lines 29-36). In fact, all of *Nagashima*'s Examples only use a T-Fe_2O_3 content of 0.63 or less (see, Id. at TABLE 1). As such, one skilled in the art would have no reason to modify *Nagashima*'s glass composition to increase its T-Fe_2O_3 content to a higher level of 0.98 to 1.3 mass% as recited in independent claim 1. Thus, independent claim 1 is patentable over *Nagashima*. So are claims 17-20 since these claims depend from claim 1. Claim 17 is further patentable over *Nagashima* for the additional reason that *Nagashima* does not disclose a glass that both has a thickness range of 1.3 to 1.8 mm, as recited in claim 17, and a combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35, as recited in claim 1. Applicants cancel claims 2-16, 21 and 22 without prejudice and thus the § 102 rejection of claims 2-8, 10 and 12 over *Nagashima* is now moot.

Claims 1-6, 12, 13 and 18-20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Morimoto* et al. (US Pat No 5,362,689). Applicants respectfully traverse this rejection. *Morimoto* relates to a glass composition that includes a T-Fe_2O_3 content of 0.10-0.60 wt%, a CeO_2 content of 0.10-0.40 wt% and a FeO ratio of 0.3-0.7 (see, e.g., *Morimoto* at Abstract). Thus, *Morimoto* fails to disclose the combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275

to 0.35, as claimed in independent claim 1. Also, *Morimoto* clearly teaches against the use of T-Fe_2O_3 and CeO_2 contents that are higher the respective ranges disclosed by *Morimoto*. For example, at column 4, lines 42-54, *Morimoto* states: "In the glass the amount of total iron expressed as Fe2O3 is from 0.58 to 0.80 wt %. ... if it exceeds 0.80 wt % the glass becomes too low in visible transmittance and takes on an undesirably dark tint. ... In general it is preferable to control the total iron content in the range from 0.60 to 0.71 wt %." At column 5, lines 43-52, *Morimoto* also states: "In this invention specific and relatively small amounts of CeO_2 and TiO_2 are used in combination in order to afford the glass with desirably balanced optical characteristics without greatly varying the degree of reduction of iron in the conventional glass melting furnaces. In the glass the amount of CeO_2 is from 0.1 to 0.6 wt %, and the amount of TiO_2 is from 0.1 to 0.4 wt %. In many cases it suffices to use a combination of 0.2-0.35 wt % of CeO_2 and 0.1-0.2 wt % of TiO_2." As such, one skilled in the art would have no reason to modify *Morimoto*'s glass composition to increase its T-Fe_2O_3 and CeO_2 contents to higher levels of 0.98 to 1.3 mass% and 0.65 to 2.0 mass% respectively as recited in independent claim 1. Thus, independent claim 1 is patentable over *Morimoto*. So are claims 17-20 since these claims depend from claim 1. Claim 17 is further patentable over *Morimoto* for the additional reason that *Morimoto* does not disclose a glass that both has a thickness range of 1.3 to 1.8 mm, as recited in claim 17, and a combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35, as recited in claim 1. Applicants cancel claims 2-16, 21 and 22 without prejudice and thus the § 102 rejection of claims 2-6, 12 and 13 over *Morimoto* is now moot.

Claims 1, 2, 4, 5, 14, 15, 16, 17, 19 and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Gulotta* et al. (US Pat No 5,240,886). Applicants respectfully traverse this rejection. *Gulotta* relates to a glass composition that includes a T-Fe_2O_3 content greater than 0.85 wt%, a CeO_2 content less than 0.5% and a FeO ratio less than 0.275 (see, e.g., *Gulotta* at column 2, lines 55-68). Thus, *Gulotta* fails to disclose the combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35, as claimed in independent claim 1. Also, *Gulotta* repeatedly teaches against the use of a CeO_2 content and a FeO ratio that exceed

the respective ranges disclosed by *Gulotta*. For example, at column 2, lines 49-66, *Gulotta* states:

> An objective of the present invention is to provide green tinted glass that has luminous transmittance of at least 70 percent and ultraviolet transmittance of no more than 31 percent (both transmittances at a reference thickness of 3.9 millimeters), without requiring the use of as much costly cerium oxide as in prior compositions of this type. These properties may be achieved by the present invention with less than 0.5 percent by weight CeO_2 in the glass, preferably less than 0.4 percent by weight CeO_2. The optimized embodiments of the present invention contain less than 0.35 percent by weight CeO_2. Compared to competing glasses, the glasses of the present invention are characterized by larger amounts of total iron and smaller proportions of the iron in the ferrous state. The total iron (expressed as $Fe_2 O_3$) is greater than 0.85 percent by weight of the total glass composition, and the ratio of FeO/total iron (ferrous iron expressed as FeO divided by the total iron expressed as Fe_2O_3) is less than 0.275.

At column 4, lines 13-19, *Gulotta* also states:

> ... making the conditions more oxidizing in accordance with the present invention may yield ferrous to total iron ratios that are relatively low for dark green glass, but not substantially different from those for lightly tinted or clear glass. Therefore, the requirement of a ferrous to total iron ratio less than 0.26 in the present invention is relatively low for this type of glass.

At column 4, lines 13-19, *Gulotta* further states:

> Minimizing the amount of cerium oxide used is best for meeting the objectives of reducing the cost of the glass and avoiding solarization, and Example 4 is an embodiment within the scope of the invention in which no cerium was used. However, the very low ferrous to total iron ratio required when no cerium is used may be difficult to attain in some melting furnaces. Therefore, it is preferred that a small amount of cerium be used to yield the desired reduction in ultraviolet transmittance without requiring an unduly low ferrous to total iron ratio. Additionally, cerium oxide is itself an oxidizing agent whose presence assists in attaining the required ferrous to total iron ratio. Accordingly, the preferred embodiments disclosed above include 0.20 to 0.35 percent by weight CeO.sub.2 although some commercially operating furnaces may require up to 0.4 percent or more.

As such, one skilled in the art would have no reason to modify *Gulotta*'s glass composition to increase its CeO_2 content and FeO ratio to higher levels of 0.65 to 2.0 mass% and 0.275 to 0.35 respectively as recited in independent claim 1. Thus, independent claim 1 is patentable over *Gulotta*. So are claims 17-20 since these claims

depend from claim 1. Claim 17 is further patentable over *Gulotta* for the additional reason that *Gulotta* does not disclose a glass that both has a thickness range of 1.3 to 1.8 mm, as recited in claim 17, and a combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35, as recited in claim 1. Applicants cancel claims 2-16, 21 and 22 without prejudice and thus the § 102 rejection of claims 2, 4, 5, 14, 15 and 16 over *Gulotta* is now moot.

Claims 1-8, 10, 14, 19 and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Cheng* (US Pat No 5,077,133). Applicants respectfully traverse this rejection. *Cheng* relates to a glass composition that includes a T-Fe_2O_3 content of 0.51-0.96 wt%, a CeO_2 content of 0.2-1.4 wt% and a FeO content of 0.15 to 0.33 wt% which corresponds to a FeO ratio of 0.23 to 0.29 (see, e.g., *Cheng* at column 3, lines 40-44). Thus, *Cheng* fails to disclose the combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35, as claimed in independent claim 1. Also, *Cheng* clearly teaches against the use of a T-Fe_2O_3 content that is higher the range disclosed by *Cheng*. For example, at column 6, lines 61-64, *Cheng* states: "if an amount of total iron higher than the critical amount is used, less heat will be able to penetrate the interior of the melt, and the batch melting process will become increasingly more difficult." In fact, all of *Cheng*'s working Examples only use a T-Fe_2O_3 content of 0.85 or less (see, Id. at TABLE III). As such, one skilled in the art would have no reason to modify *Cheng*'s glass composition to increase its T-Fe_2O_3 content to a higher level of 0.98 to 1.3 mass% as recited in independent claim 1. Thus, independent claim 1 is patentable over *Cheng*. So are claims 17-20 since these claims depend from claim 1. Claim 17 is further patentable over *Cheng* for the additional reason that *Cheng* does not disclose a glass that both has a thickness range of 1.3 to 1.8 mm, as recited in claim 17, and a combination of T-Fe_2O_3 content of 0.98 to 1.3 mass%, CeO_2 content of 0.65 to 2.0 mass% and FeO ratio of 0.275 to 0.35, as recited in claim 1. Applicants cancel claims 2-16, 21 and 22 without prejudice and thus the § 102 rejection of claims 2-8, 10 and 14 over *Cheng* is now moot.

Claims 9, 11, 13, 21 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Nagashima*; claims 21 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Morimoto*; and claims 9, 11, 15, 21 and 22 stand rejected

under 35 U.S.C. § 103(a) as being unpatentable over *Cheng*. Applicants cancel claims 2-16, 21 and 22 without prejudice and thus these rejections are now moot. Applicants are not conceding the correctness of the rejections.

In view of the above amendments and remarks, Applicants respectfully request favorable reconsideration of this application in the form of a Notice of Allowance. If any questions arise regarding this communication, the Examiner is invited to contact Applicants' representative listed below.

Respectfully submitted,

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